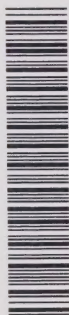


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Canada, Mines, Bureau of. Explosives
Division

CANADA
DEPARTMENT OF MINES AND RESOURCES
MINES AND GEOLOGY BRANCH



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ANNUAL REPORT

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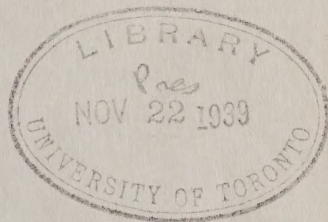
EXPLOSIVES DIVISION

OF THE

BUREAU OF MINES

FOR THE CALENDAR YEAR

1938




CANADA
DEPARTMENT OF MINES AND RESOURCES
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ANNUAL REPORT
OF THE
EXPLOSIVES DIVISION
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BUREAU OF MINES
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ANNUAL REPORT
OF THE
EXPLOSIVES DIVISION OF THE BUREAU OF MINES
FOR THE CALENDAR YEAR 1938

BY
F. E. Leach

The following report deals with the administration of the Explosives Act during the year ending December 31, 1938.

STAFF

No change has been made in the permanent staff of the Explosives Division during the past calendar year.

MANUFACTURE OF EXPLOSIVES

A list of the owners, locations, and products of factories licensed for the manufacture of explosives and fireworks is given in Appendix A. One small factory which has not been operated for some time has been dropped from the list. The Hitt Fireworks Company of Seattle, Wash., U.S.A., has put up a small branch factory near Port Moody, B.C., where it is now producing certain grades of fireworks.

Inspectors of the Division made 36 inspections of factories during the year, and it was found that the regulations and terms of the licences were generally well observed.

A number of proposals for alterations and additions to factory buildings and equipment designed to provide increased manufacturing or storage facilities were examined, and as approved were embodied in the licences.

The production of explosives during the calendar year under review is given in Appendix B, tabulated in various classes. The record output of commercial explosives in 1937 has again been surpassed, and amounted in 1938 to approximately 36,500 tons.

ACCIDENTS IN MANUFACTURE

During the past year no accidents occurred in manufacture that involved loss of life, or injury to persons or equipment.

MAGAZINES

At the end of the year, 344 magazines of explosives were being operated under licence and 240 under temporary magazine licence.

Inspectors of the Division made 384 visits of inspection to magazines during the year, and 288 inspections were made by deputy inspectors of the Royal Canadian Mounted Police.

Licence holders were found to be complying in a satisfactory manner with the regulations and conditions under which the licences had been issued.

THEFTS OF EXPLOSIVES

Twenty-nine cases of theft of explosives were reported during the year involving a total of about 7,650 pounds of explosives, 6,200 detonators and a small quantity of fuse. Approximately half of this total was subsequently recovered by the police. Strongly built permanent magazines of brick or concrete were as often robbed as were the lighter structures used for temporary storage. One first class magazine was broken into and robbed on three different occasions during the year.

EXPLOSIVES DESTROYED

An unusually large quantity of deteriorated explosives was destroyed during the year. Three large caches accounted for the greater part of the total. Of these, two were destroyed by officials of the company manufacturing explosives, and one by officials of a provincial Department of Mines, in each case after consultation with this Division.

The total amount destroyed was 67,093 pounds of high explosives, 16,881 detonators, 2,300 units of fireworks, and some miscellaneous small items including a bottle of nitro-glycerine taken by the police from a robber. Of the explosives destroyed 4,613 pounds and 500 detonators were found by inspectors of the Division in licensed magazines, the remainder having been stored under conditions that did not require licensing and inspection under the Explosives Act.

EXPLOSIVES FOUND

In twenty-three cases explosives were found with no claimant to ownership. In some instances the owner, having no further use for the material, had abandoned it. In others it had been lost, or again it may have consisted of some burglar's loot which being surplus to his requirements had been discarded or hidden.

Police searching a suspect's room found dynamite and detonators. Six sticks of dynamite with fuse and cap attached were found on the steps of a dwelling house. A boy found some detonators in the bush near a recently completed golf course. A case of explosive was stored and forgotten in an old boiler at an abandoned oil well. A number of rockets with which it was hoped to cause a rainfall in a dry area were left for many years in a barn. A young man who found them and caused their explosion was injured in the hand. Indian boys playing in a muskeg came across three cases of explosive that were hidden there.

UNLICENSED PREMISES

About 700 visits of inspection to unlicensed premises were made by inspectors of the Division, and 2,400 by deputy inspectors of the Royal Canadian Mounted Police. It would be impossible for the inspectors of the Division, without the help and co-operation of this force, to carry out any adequate inspection service in regard to the sale of explosives and small arms ammunition in unlicensed premises. Owing to the educational work that has been carried on for many years it is now a comparatively rare occurrence to find any case of non-compliance with the regulations regarding the registration of sales of explosives and of ammunition.

IMPORTS

The quantities of explosives, of the several classes, imported during the year are given in Appendix C. These importations were made under the authority of 448 permits and 45 special permits.

The amount of explosives imported for use as such is small, the greater part being destined for incorporation in other explosives, or for use in the manufacture of lacquers and similar goods. Considerable quantities of manufactured fireworks are imported, about four-fifths of the total coming from China. The principal port of entry of these fireworks is Vancouver where they are examined by the Dominion Analyst in co-operation with the Customs officer and deputy inspectors of the Royal Canadian Mounted Police.

Of the Chinese fireworks presented for importation about 2 per cent was rejected, practically all for faults in functioning. Rejections were made on account of fuses of variable time of burning involving danger in use, and because of smouldering debris, and debris breaking into flame presenting a serious fire hazard.

AUTHORIZATION OF EXPLOSIVES

A complete list of all explosives authorized for manufacture or use in Canada is given in Appendix C. This list is similar to last year's with the following exceptions. Polar Monobel 14 Sheathed, after examination, has been authorized instead of having only provisional authorization. Certain explosives made by the Hercules Powder Company for special seismographic work have been authorized, and there have been three additions to the list of makers of authorized fireworks.

Two high explosives presented for authorization were refused after examination.

Routine analytical examinations of the products of the factories manufacturing explosives were carried out. Fireworks submitted for authorization were examined chemically and tested for functioning. In all, 139 chemical analyses were made, 18 being of high explosives. In addition to the foregoing the Dominion Analyst at Vancouver made 217 chemical examinations of fireworks imported through that port.

PROSECUTIONS

Proceedings were taken in seven cases of violation of the Explosives Act. Convictions were obtained and fines imposed, the offences being:—

Not keeping records of sales.....	1
Illegal storage of explosives.....	4
Carelessness in operations.....	1
Illegal transportation.....	1

In addition to the above a number of more serious charges were laid under the Criminal Code, and the offenders were sentenced to long terms of imprisonment. These offences included theft of explosives from a magazine, illegal possession of explosives and safe-blowing equipment, receiving stolen explosives. An automobile in which an attempt was made to smuggle unauthorized explosives into the country was confiscated and the owner fined.

ACCIDENTS

The total number of accidents in the use of explosives showed a marked decrease from the previous year, 163 against 194, but unhappily the number of fatalities was much greater, 53 in 1938, and 38 the year before. A fatal accident occurred for each 715 tons of explosive manufactured, and an injury for each 405 tons. The corresponding figures for the average of the past 16 years are 651 tons and 213 tons respectively. Although this shows a considerable improvement when the average of a number of years is taken, it is, as regards fatal accidents, very much worse than in either of the two preceding years.

It is difficult to account for the variation in the proportion of fatal and non-fatal accidents. In 1938 the number of deaths was 46 per cent of the number of accidents, in 1937 it was 23½ per cent, and the average for 16 years was 32 per cent.

Playing with detonators and other explosives accounted for the death of 2 and injuries to 46, practically the same figures as in 1937. The victims of this kind of accident are usually children who obtain explosives that have been carelessly and illegally stored or abandoned.

A summary of the accidents recorded during the year is given in Appendix D. These have been classified according to their causes. The figures show a striking similarity from year to year, the most prolific causes of accidents being failure to get away from the shot hole, returning too soon, projected debris, or not taking sufficient cover, and entering closed chambers before the fumes of explosion have been dissipated or removed by proper ventilation. It should be recognized that it is impossible to make an explosive quite free from noxious gases, and that even the best will vary in the amount of fumes produced according to the conditions under which it is fired.

That loaded holes may be discharged by lightning has again been demonstrated by fatal occurrences. Three men were killed when charging holes at the bottom of a shaft during an electrical disturbance. It is thought that an electric current entering the shaft by the hoisting cable induced currents in the connecting wires and fired the shots. In another place where a surface excavation was being carried on, a large number of holes had been drilled and loaded preparatory to firing them by an electric

current. A thunderstorm came up and a bolt of lightning fired about one-fifth of the holes, fatally injuring a man. In a coal mine a pocket of gas was ignited at a distance of almost 4,000 feet from the entrance and three men were killed by the ensuing explosion. Investigation showed that a current of lightning entered the mine by the rails, causing sparks that initiated the ignition of the gas pocket.

When rubbish from a police station was being burned an explosion occurred. It is believed that a suspect, about to be searched, had got rid of a small phial of nitroglycerine by slipping it into the waste-paper basket. There were no casualties.

While carrying on his person both dynamite and detonators a miner was grinding an axe in a blacksmith shop. There was an explosion which killed the miner and injured three other persons who were present at the time.

During a wedding celebration a bonfire was lit and three marine rockets were thrown on the fire. They exploded and one injured a girl spectator. These rockets were thought to have been some that had been salvaged from a shipwreck 27 years before and had been stolen from their place of storage shortly before this occurrence.

A new method has been devised for destroying the teredoes that attack the piling in wooden wharves located in tidal waters. This consists in exploding small charges of dynamite in the surrounding water at stated intervals, and it has been found to give satisfactory results when the wharf is expected to be in use for a few years only. The total cost of building an unprotected wharf and destroying the teredoes with dynamite may be less than building it originally with teredo-proof piles. Great care should be exercised in carrying out this work, and the method of exploding the charges should be closely supervised. Apparently a practice has arisen of using a very short fuse to prime the cartridge, lighting it, and then throwing it into the water. This is extremely dangerous and causes frequent accidents. A man was engaged in blasting for teredo destruction. He apparently held a charge too long after lighting the fuse and was practically blown to pieces. A young student of a foreign university was in Canada on a three months' permit for the purpose of studying logging operations. While learning this method of protecting a wharf against teredoes he held a lighted charge too long and lost a hand, and sustained severe facial injuries.

A boy, age 11, ran out to play with a package of small firecrackers and some matches which he carried together in his trousers' pocket. When he felt the matches ignited and the firecrackers exploded in his pocket. He sustained a severe burn on his thigh.

APPENDIX A

Factories Licensed to Manufacture Explosives in 1938

Owner	Location of factory	General nature of product	Remarks
Canadian Industries, Ltd.....	Beloil, Que.....	Blasting explosives, black powders, propellants.	
Canadian Industries, Ltd.....	James Island, B.C..	Blasting explosives, black powders.	
Canadian Industries, Ltd.....	Nobel, Ont.....	Blasting explosives.	
Canadian Industries, Ltd.....	Brainerd, Man.....	Blasting explosives.	
Canadian Industries, Ltd.....	Brownsburg, Que....	Ammunition, detonators, etc.	
Canadian Safety Fuse Co.....	Brownsburg, Que....	Safety fuse.	
T. W. Hand Fireworks Co., Ltd.	Dixie, Ont.....	Fireworks.	
B. Marroni.....	Ville St. Pierre, Que.	Fireworks.....	Operation intermittent.
Macdonald Metal Products Co., Ltd.	Waterloo, Que.....	Toy pistol caps.	
Hitt Fireworks Co.....	Port Moodie, B.C...	Fireworks.	

APPENDIX B

Production of Explosives in Canadian Factories during the Year 1938

	Quantity
Class I. Gunpowder.....	98,225 lb.
“ II. Nitrate mixtures.....	1,437,425 “
“ III. Nitro-compounds—	
Division 1 and 2.....	71,417,689 “
“ V. Fulminates—	
Division 1.....	Output of one factory.
Division 2.....	Output of one factory.
“ VI. *Ammunition—	
Division 1—	
Safety cartridges.....	126,724,953
Safety fuse.....	Output of one factory.
Railroad torpedoes.....	Output of one factory.
Percussion caps.....	Output of one factory.
Division 3—	
Detonators and electric detonators.....	Output of one factory.
“ VII. Fireworks—	
Division 2—	
Commercial and display fireworks, fuse lighters, toy caps and railroad signals.	(Approx. value) \$98,189

*Exclusive of artillery ammunition but includes small arms ammunition made in Government factories.

APPENDIX C

Explosives Imported into Canada, January 1 to December 31, 1938

Class	Division	Description	Quantity
I		Gunpowder.....	1,155 lb.
II		Nitrate mixtures.....	9,608 "
III	1	Mixtures containing liquid nitro-compound.....	13,320 "
	2	Nitro-compounds:—	
		(a) Propellants.....	41,969 "
		(b) For use in explosive factories.....	346,153 "
		(c) For other manufacturing purposes.....	6,092,151 "
VI	1	Percussion caps.....	231,056 "
		Safety fuse.....	3,742 feet
	2	Miners' squibs.....	299,000
		Detonating fuse.....	349,165 feet
	3	Detonators and electric detonators.....	9,344
		Fuses (whaling).....	560
VII	2	Manufactured fireworks.....	565,000 lb.
		Miscellaneous.....	400 "

APPENDIX D

Accidents from Explosives during the Calendar Year 1938

Circumstances or Cause	Mines and Quarries			Elsewhere			Total		
	Number of			Number of			Number of		
	Accidents	Killed	Injured	Accidents	Killed	Injured	Accidents	Killed	Injured
In Use—									
(a) Prematures, and failing to get away from the shot hole.	14	3	17	8	4	5	22	7	22
(b) Firing by electricity when persons are at the shot hole.	2	.....	2	.....	.....	.....	2	.....	2
(c) Not taking proper cover.	3	.....	3	3	2	1	6	2	4
(d) Projected debris.	7	.....	8	3	3	.....	10	3	8
(e) Hangfires, and returning too soon to shot hole.	11	1	10	7	3	6	18	4	16
(f) Tampering with misfired shots.	.....	.....	.....	.....	.....	.....	.....	.....	.....
(g) Ramming or stemming the charge.	2	3	1	1	1	.....	3	4	1
(h) Sparks, flame, etc.	1	2	.....	2	2	.....	3	4	.....
(i) Boring into unexploded charge.	6	1	9	1	2	3	7	3	12
(j) Striking unexploded charge in removing debris.	2	.....	2	.....	.....	.....	2	.....	2
(k) Preparing charges.	2	.....	2	3	3	.....	5	3	2
(l) Lighting fuse before inserting charge.	.....	.....	.....	5	3	2	5	3	2
(m) Fumes.	10	7	7	1	1	.....	11	8	7
(n) Springing or socketing shots.	2	.....	2	2	2	.....	4	2	2
(p) Various.	12	7	10	1	1	.....	13	8	10
	74	24	73	37	27	17	111	51	90
In Manufacture.	.....	.....	.....	.....	.....	.....	.....	.....	.....
In Keeping.	.....	.....	.....	.....	.....	.....	1	.....	1
In Conveyance (other than by railway).	.....	.....	.....	.....	.....	.....	.....	.....	.....
	.....	.....	.....	.....	.....	.....	1	.....	1
Miscellaneous—									
(a) Playing with detonators.	.....	.....	.....	.....	.....	.....	25	.....	26
(b) Playing with other explosives.	.....	.....	.....	.....	.....	.....	20	2	23
(c) Various.	.....	.....	.....	.....	.....	.....	6	.....	6
	.....	.....	.....	.....	.....	**	51	2	55
Totals, all circumstances.	74	24	73	37	27	17	163	53	146

*Except for these, accounts of which are given in the text, the accidents given in this table occurred in circumstances not directly controlled by the Act.

**Circumstances are given on next page.

APPENDIX D—Continued

Playing with Detonators

Cause of Accident	Killed	Injured
A miner, age 22, while returning some electric blasting caps to owner, attempted to pull the wires from one of them causing it to explode. He received injuries to his left hand which necessitated amputation of all five fingers.		1
Youth, age 20, while cleaning up a workshop found what he thought was a 22. R.F. shell. He laid it on a table and struck it with a hammer. He was injured about eyes, face, and chest by the explosion.		1
Boy, age 12, found several detonators in the cellar of an empty house. He scratched one on the wall causing it to explode. He lost the thumb and two fingers of his right hand.		1
Boy, age 12, found a detonator left behind by workmen and applied a match to it; it exploded. He lost thumb and forefinger of left hand and received injuries to his eyes.		1
Boy, age 16, while cleaning out a drawer found four detonators. He placed one on the stove causing it to explode. He lost two fingers of left hand.		1
Boy, age, 12, playing with a detonator near a stove caused it to explode. He lost thumb and two fingers of left hand.		1
Two men, ages 78, 30, were making a ferrule for a fishing rod by filing the end off a detonator. The elder man lost an eye by the explosion the younger, three fingers of his right hand.		2
Man, while in workshop picked up a copper tube. Not knowing it was a detonator attempted to drive a hole through it with a nail. He lost three fingers by the explosion.		1
Youth found a detonator near railroad. While playing with it he caused its explosion. He lost three fingers of left hand and his left eye.		1
Boy, age 11, proposing to make a bushing for a toy propeller placed a drill in a detonator and struck it with a hammer. He received lacerations to left hand.		1
Boy, age 8, playing around the cap house on a mining property found a capped fuse. He applied a light to it. He lost two fingers of left hand.		1
Boy, age 14, found a detonator which exploded while he was playing with it. His right hand was badly lacerated.		1
Boy, age 11, found a detonator on his father's farm. He applied a light and lost two fingers and thumb of his left hand by the explosion.		1
Boy, age 7, found a number of detonators in a culvert. He struck one with a stone causing it to explode. His hand was badly mangled necessitating amputation of one finger.		1
Man, age 22, found detonators and rockets discarded over twelve years ago. He picked up a detonator and applied a match. He lost thumb and two fingers by the explosion.		1
Boy, age 13, found a detonator near his home; while playing with it, it exploded. He lost thumb and four fingers of his right hand. Other boys admitted having broken into a nearby licensed magazine, stolen the detonators and scattered them about the fields. Out of 200 detonators missing 125 have been accounted for.		1
Boy, age 6, found a detonator in his father's barn, while playing with it he caused it to explode. He lost two fingers of left hand and received injuries to his face.		1
Boy found a detonator near railroad track. He struck it with a rock. His right hand and face were badly lacerated by the effects of the explosion.		1
Boy, age 10, lost three fingers and received facial wounds when a detonator with which he was playing exploded.		1
Boy, age 12, found a detonator near an abandoned mine. He struck it with a rock without exploding it. He then applied a light to the loosened powder and received severe burns to hands and face.		1
Boy, age 8, found a detonator in an old shack. He pounded it with a rock. He lost three fingers of left hand by the explosion which followed.		1
Boy, age 15, while playing with detonators applied a light to one. It exploded. He lost two fingers and thumb.		1

APPENDIX D—Continued

Playing with Detonators—Concluded

Cause of Accident	Killed	Injured
Boy, age 11, found a detonator in unlocked toolbox and ignited it with a match. He lost thumb of left hand and received severe injuries to face.....		1
Boy, age 13, applied a light to a detonator. It exploded. He lost his left eye and received severe injuries to face and body from projected metal.....		1
Boy, age 10, with companions found a box of detonators on a farm. He tried to open one of the detonators with a knife when it exploded. He lost thumb and tips of three fingers of one hand and severe injuries to chest and abdomen.....		1

Playing with other Explosives

<i>Dynamite—</i>		
Young man, age 21, died from injuries received when a stick of dynamite exploded in his hands.....	1	
<i>Powders—</i>		
Boy, age 13, found a discarded can of gunpowder on a rubbish heap of a store. He applied a lighted match to the contents. The powder exploded in his face causing severe burns.....		1
Two high school students made a bomb from 1-inch pipe using a potassium permanganate-sulphur mixture which exploded while loading. Both received severe burns and other injuries.....		2
Boy, age 11, accepting a dare from older companions dropped a lighted match into a can containing a mixture of gunpowder and kerosene. He was burned about head, face, and arms by the explosion.....		1
Boy, age 16, experimenting with powder was ramming it into a 3-inch iron pipe embedded in earth when it exploded. He was severely lacerated about the feet and legs.....		1
Student experimenting with magnesium powder was severely burned about hands and face when it exploded.....		1
<i>Small Arm Ammunition—</i>		
Boy took powder from a shotgun shell, placed it in a bottle and threw in a lighted cigarette stub. He lost left eye and suffered injuries to left hand.....		1
Boy, age 8, found two shot shells in vacant house. He extracted the powder and applied a match to it. He was severely burned about head and face.....		1
Boy, age 14, found a rifle cartridge and struck primer with a hammer. The bullet lodged in his hand when the cartridge exploded.....		1
Youth, age 19, was painfully burned when playing with powder taken from a shotgun shell.....		1
<i>Fireworks—</i>		
Boy threw lighted firecracker into display of fireworks in store window causing \$200 damage.....		4
Two accidents were caused by boys picking up firecrackers which they thought had misfired and which exploded in their faces.....		2
Four accidents were due to boys picking up firecrackers which they thought had misfired, and returning them to their pockets containing other firecrackers.....		5
Boy, age 8, was injured when a firecracker exploded in his face. It had been thrown by a companion.....		1
Girl, age 6, ignited her dress by a firecracker and was seriously burned.....		1
Child, age 3, ignited her dress when trying to light a firecracker. She died from injuries.....	1	

APPENDIX D—*Concluded*

Miscellaneous

Cause of Accident	Killed	Injured
While testing explosive taken from a home-made bomb, an explosion occurred. Projected material struck and critically injured a bystander. The bomb had been intended for an outrage during an industrial dispute....		1
Man using a welding torch in a garage exploded two detonators which he was carrying in his vest pocket.....		1
Man threw a cigarette butt in the gutter. It ignited some gunpowder which had been thrown there by some boys. A boy passing at the time was severely burned.....		1
During a fireworks display sparks from a rocket ignited other fireworks nearby. One man was severely burned about face, head, and hands....		1
Man struck by firerocket during election celebration was critically injured....		1
During a wedding celebration a bonfire was lit and several signal bombs, stolen from a fisherman's shack, were thrown on the fire. An explosion followed injuring a spectator.....		1

APPENDIX E

Authorized Explosives

Explosives manufactured by Canadian firms as hereunder detailed:—

Canadian Industries, Ltd.

Polar dynamite—25, 30, 35, 40, 50, and 60 per cent.
 Polar Mineite—35, 40 per cent.
 Polar Ammonia Dynamite—20, 25, 30, 35, 40, 50, and 60 per cent.
 Polar Stopeite—20, 25, 30, 35, 40, 50, 55, and 60 per cent.
 Polar Gelatinized Dynamite—50, 60, and 75 per cent.
 Polar Forcite Gelatin—30, 35, 40, 50, 60, 75, 80, and 90 per cent.
 Giant Gelatin—20, 25, 30, 35, 40, 50, 60, 75, 80, and 90 per cent.
 Polar Monobels, 7 Sheathed.
 14 Sheathed.
 Polar Monobels, Nos. 4, 6, 7, and 14.
 Polar CXL-lite No. 2.
 Polar Cilgel.
 Polar Driftite.
 Gelatin Dough.
 C. X. L. Special Gelatin No. 1.
 C. X. L. Special Dynamite No. 1, No. 2, and No. 3.
 Polar Stumping No 1, Extra, and Dominion Stumping No. 1.
 Blastol.
 S. N. G.
 Gypsumite "A", "B," and "C."
 Cordite.
 Black Blasting Powders.
 Black powder pellets.
 Gunpowder.
 Sporting powders.
 Safety fuse powders.
 Safety fuse lighters.
 Signal bombs.

Canadian Safety Fuse Co., Ltd.

Safety fuse—"Clover" brand.
 Safety fuse—"Black Clover" brand.
 Safety fuse—"Beaver" brand.
 Safety fuse—"White Jacket" brand.
 Safety fuse—"Crown" brand.
 Safety fuse—"Moose" brand.
 Safety fuse—"Pacific" brand.
 Fuse lighters.

Canadian Industries, Ltd. (Dominion Ammunition Divn.).

Ammunition.
 Detonators.
 Lead Azide.
 Lead Trinitroresorcinate.
 Percussion caps.
 Railway torpedoes.
 Electric detonators.
 Railway fusees.
 Tetrazene.

All explosives on the British authorized list are provisionally authorized in Canada, and in addition those manufactured by the following firms, as detailed below:—

- American Powder Co., Maynard, Mass.
American, R.C. 22 short.
- Atlas Powder Co., Wilmington, Del.
Electric blasting caps, Nos. 6, 7, and 8.
Blasting caps, Nos. 6, 7, and 8.
Nitrocellulose.
Trinitrotoluene.
- Brücker and Zinke, Meissen, Germany.
Safety fuse—"Globe" brand.
- Brücker and Zschetzsche, Minden, Germany.
Safety fuse—black fuse "Triumph" brand.
Safety fuse—white fuse "Triumph" brand.
- California Cap Co., Oakland, Cal.
Detonators.
- Central Railway Signal Co., Boston, Mass.
Railway torpedoes.
Railway fusees.
- Dumore National Chemical Co., Seattle, Wash.
Regina Stumping powder Nos. 1 and 2.
Regina rock powder Nos. 1 and 2.
- E. I. Dupont de Nemours & Company, Inc., Wilmington, Del.
Dupont bulk rifle powders (Nos. 80, 92).
Dupont smokeless shotgun powder.
Dupont pistol powders Nos. 5 and 6.
Dupont sporting rifle powders.
Balistite smokeless shotgun powder.
Improved military rifle powders.
Dupont dense smokeless shotgun powder.
Fulminate of mercury.
Guncotton.
Trinitrotoluene.
Tetryl.
Dynamite and blasting gelatin.
Agritol.
Cordeau connector cap and clip.
- Ensign Bickford Co., Simsbury, Conn.
Cordeau-Bickford fuse.
Pull wire fuse lighters.
Primacord.
- Hercules Powder Co., Wilmington, Del.
Bullseye revolver powder.
Hercules smokeless rifle powder.
Hercules smokeless shotgun powder.
Infallible smokeless shotgun powder.
Dynamite and blasting gelatin.
Vibrogel A, B, C, and 3.
Vibro caps.
- Illinois Powder Manufacturing Co., St. Louis, Miss.
Ammonia dynamite—40 and 60 per cent.
Powdertol No. 1 and No. 3.
- Independent Eastern Torpedo Co., Findlay, Ohio.
Nitroglycerine.

King Powder Co., King's Mills, Ohio.
Semi-smokeless powder.

Maison Farman, Billancourt, France.
Farman aero starting cartridge.

Poudreries Réunies, Brussels.
Safety fuse—"Shamrock" brand.

John R. Powell, Plymouth, Pa.
Miners' squibs.

Safety Mining Co., Chicago, Ill.
Cardox.

Trojan Powder Co., Allentown, Pa.
Trojan blasting. CC
Trojan TL 502.
Trojan 35 per cent standard.
Trojan 40 per cent standard.
Trojan 40C.
Trojan 50C.

United Railway Signal Corporation, Newton, Mass.
Railway torpedoes.

Western Cartridge Co., East Alton, Ill.
Detonators.

Authorized Explosives (Manufactured Fireworks)

Manufactured fireworks on the British authorized list are provisionally authorized in Canada.

All fireworks as manufactured by the following Canadian makers are authorized:—

Macdonald Metal Products Company, Ltd., Waterloo, Que.
Marroni, Berardo, St. Pierre, Que.
Toronto Fireworks Co., Ltd., Islington, Ont.
T. W. Hand Co., Ltd., and Dominion Fireworks Co., Dixie, Ont.
Hitt Fireworks Co., Port Moody, B.C.

Certain fireworks manufactured by the following foreign makers are authorized:—

Germany:

Blumberg and Co., Dusseldorf.
Eisfeld, J. F., Silberhutte, Anhalt.
Eckhardt, C. F., Nuernberg.
Fischer, Wilhelm, Worbis, Wurtemberg.
Geb. Weinrich, Worbis, Thuringen.
Gerka Werke, Offenbach on Main.
Hamburg-Bremer Handelgesellschaft, Hamburg.
Nicolaus H. and Co., Memingen, Thuringen.
Trummer and Co., Hamburg.
Wicks, Fred, Barmen.

Japan:

Hirono Shoten, Kobe.

United States:

Acme Pistol Cap Co., Columbus, O.
American Fireworks Co., Boston, Mass.
Antonelli Fireworks Co., Rochester, N.Y.
Backes, M. Sons Inc., Wallingford, Conn.

United States—*Concluded*

Burke and James Inc., Chicago.
 Central Railway Signal Co., Boston, Mass.
 Continental Fireworks Manufacturing Co., Dunbar, Pa.
 Coston Supply Co., New York.
 Edmiston Manufacturing Co., Columbus, Ohio.
 Edwards Co., Cincinnati.
 Essex Specialty Co., Berkeley Heights, N.J.
 Federal Buster Corporation, Pittsburgh.
 Hill, E. Vernon, Chicago, Ill.
 Hitt Fireworks Co. Inc., Seattle.
 Hubley Manufacturing Co., Lancaster, Pa.
 International Fireworks Co., New York.
 International Flare Signal Co., Tiptecanoe City, Ohio.
 Interstate Fireworks, Springfield, Mass.
 Jedel, A., Newark, Del.
 Kilgore Manufacturing Co. Inc., Westerville, Ohio.
 Los Angeles Fireworks Co., Los Angeles.
 Marshall, John C., Brooklyn, N.Y.
 National Fireworks Inc., West Hanover, Mass.
 New Jersey Flugent Co., New Brunswick, N.J.
 Norman Willets Photo Supply Co., Chicago.
 Potts Fireworks Display Co., Franklin Park, Ill.
 Red Flare Signal Corporation, Frostoria, Ill.
 Rochester Fireworks Co., Rochester, N.Y.
 Safety Automatic Toy Co., Dayton, Ohio.
 Smith, Jas. H., Griffith, Ind.
 Standard Railway Fusee Corporation, Boonton, N.J.
 St. Louis Pistol & Caps, Inc., St. Louis, Mo.
 Triumph Fusee and Fireworks Co., Elkton, Md.
 Unexcelled Manufacturing Co., Inc., New York.
 Victory Fireworks and Specialty Co., Elkton, Md.

Small Chinese fireworks and Chinese firecrackers with gunpowder composition, and not exceeding four inches in length and nine-sixteenth inch in diameter, are authorized when found to function satisfactorily on examination at port of entry.

OTTAWA
J. O. PATENAUDE, I.S.O.
PRINTER TO THE KING'S MOST EXCELLENT MAJESTY
1939

